

**A Presentation By Tim Wagner, Utah Sierra Club  
based on the study**

# **AN INVESTIGATION OF FACTORS RELATED TO LEVELS OF MERCURY IN HUMAN HAIR**

**completed by**

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**October, 2005**

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# **MERCURY HAIR-SAMPLING STUDY**

- **Nation's largest mercury hair-sampling project ever conducted**
- **Nearly 6,600 participants recruited by Greenpeace, Sierra Club, Environmental Defense, and other conservation organizations between July 2004 and September 2005. Study ongoing.**
- **Mercury exposure can be tested by analysis of blood, urine, nail clippings, or hair clippings.**

- **Hair a good indicator for exposure over past several months or a year, whereas blood or urine used as markers for more recent exposure.**
- **Participants completed questionnaire to provide demographic factors and potential mercury exposure, such as what kinds of fish in diet and how often consumed.**
- **Study not presumed to statistically represent entire U.S. population since participants were self-selected, and some areas had stronger representation than others.**

- **EPA reference dose for hair mercury concentration established at 1.0 µg/g.**
- **Most prevalent study for comparison is the 1999-2000 National Health & Nutrition Examination Survey (NHANES).**

# **RESULTS**

- **Survey found mercury levels exceeding the EPA's recommended limit of one microgram of mercury per gram of hair in one in five women of childbearing age tested, verses EPA estimates of one in six.**
- **Medians indicate children have approximately half the concentration as adults.**
- **Men shown to have higher levels than women.**
- **NHANES 1999-2000 showed >10% of childbearing age women Hg levels greater than benchmark.**
- **This study indicates approximately 23% with levels above 1.0 µg/g.**

- **In Utah, >15% of all participants (139) have Hg levels at or above the benchmark of 1 ug/g.**
- **In Utah, approximately 10% of women participants of child bearing age in Utah have Hg levels at or above the benchmark.**
- **Midwest region shows the lowest median levels while the West has the highest. Northeast and Southeast regions similar.**
- **Strong relationship between mercury concentration in hair and seafood consumption.**
- **Participants who typically consumed 0, 1-2, 3-7, or eight or more servings of seafood (including shellfish) per month had median mercury concentrations of 0.06 ug/g, 0.21 ug/g, 0.46 ug/g, or 0.89 ug/g, respectively.**

- **Participants in this study likely greater consumers of fish than the NHANES.**
- **Study found little evidence of relationship between dental amalgams and Hg concentrations in hair while previous studies have shown a relationship.**
- **Possible explanation that inorganic Hg present in dental amalgams accumulates less in hair tissue than methylmercury intake from fish consumption.**

**Table 5. Results for States with at Least 100 Participants.**

<b>State</b>	<b>n</b>	<b>Median Mercury (ug/g)</b>	<b>Percent <math>\geq</math> 1.0 ug/g</b>	<b>Median Total Seafood Servings per Month</b>
CA	1090	0.62	30.0	5.0
CO	135	0.67	30.4	5.0
FL	389	0.61	33.4	6.0
IL	169	0.31	15.4	5.0
MA	218	0.61	27.1	5.0
MD	218	0.48	17.4	4.0
MI	115	0.38	20.9	4.0
MN	293	0.24	8.9	4.0
NC	175	0.41	15.4	4.0
NH	133	0.46	18.8	6.0
NJ	192	0.48	27.1	5.0
NY	455	0.76	40.2	5.5
OH	415	0.22	10.6	4.0
OR	130	0.62	26.2	6.0
PA	535	0.26	11.4	3.0
TX	203	0.38	15.8	5.0
UT	139	0.36	15.1	5.0
VA	149	0.40	27.5	5.0
WA	184	0.57	28.8	6.0
WI	126	0.22	10.3	4.0

**Table 6. Results for Cities with More Than 50 Participants.**

<b>City</b>	<b>State</b>	<b>n</b>	<b>Median Mercury (ug/g)</b>	<b>Percent <math>\geq</math> 1.0 ug/g</b>	<b>Median Total Servings per Month</b>
<b>Austin</b>	<b>TX</b>	<b>50</b>	<b>0.43</b>	<b>24.0</b>	<b>5.0</b>
<b>Masontown</b>	<b>PA</b>	<b>64</b>	<b>0.08</b>	<b>3.1</b>	<b>2.0</b>
<b>Miami</b>	<b>FL</b>	<b>70</b>	<b>0.38</b>	<b>30.0</b>	<b>5.0</b>
<b>Minneapolis</b>	<b>MN</b>	<b>115</b>	<b>0.26</b>	<b>8.7</b>	<b>4.0</b>
<b>New York</b>	<b>NY</b>	<b>191</b>	<b>0.88</b>	<b>47.1</b>	<b>6.0</b>
<b>Philadelphia</b>	<b>PA</b>	<b>63</b>	<b>0.35</b>	<b>20.6</b>	<b>5.0</b>
<b>Pittsburgh</b>	<b>PA</b>	<b>81</b>	<b>0.25</b>	<b>4.9</b>	<b>3.0</b>
<b>Portland</b>	<b>OR</b>	<b>54</b>	<b>0.68</b>	<b>25.9</b>	<b>6.0</b>
<b>Salt Lake City</b>	<b>UT</b>	<b>77</b>	<b>0.35</b>	<b>10.4</b>	<b>5.0</b>
<b>San Francisco</b>	<b>CA</b>	<b>122</b>	<b>0.68</b>	<b>29.5</b>	<b>4.0</b>
<b>Seattle</b>	<b>WA</b>	<b>56</b>	<b>0.61</b>	<b>32.1</b>	<b>7.0</b>
<b>Washington</b>	<b>DC</b>	<b>99</b>	<b>0.48</b>	<b>26.3</b>	<b>5.0</b>